

REMARKS

Claim 5 has been amended. No claims have been added or canceled.

Applicant believes that this amendment addresses the Examiner's rejection and that any changes do not introduce new matter into the specification, limit the scope of the claims or result in any prosecution history estoppel.

Claim Rejections – 35 USC S. 102

The Examiner stated that the rejections of claims 1-6 under 35 U.S.C. 102(b) as being anticipated by Dachiku et al.

Applicant respectfully traverses the Examiner's rejection. In particular, all of the references, either alone or in combination, fail to teach or suggest "selecting a limited number of feature points from an image of the face where minimal or no local motion is observed to be video coded" as claimed or similarly claimed.

As noted in the specification on page 8, first and second paragraph:

FIG. 1 illustrates, these triangular patches, in this particular embodiment in accordance with the invention, are divided into two classes, one class in which local motion is more significant, such as, for example, the triangular patches covering eyes, eyebrows, or mouth, denoted here $_l$, and *one class in which global motion is more significant, denoted here by the $_g$* . FIG. 1 illustrates the two classes of triangles, the shaded of triangles belonging to $_l$ and unshaded triangles belonging to $_g$.

In this embodiment, *a limited number of feature points are selected from an image of the head*. In this embodiment, enough feature points are selected from different triangular patches to obtain the desired amount of accuracy or robustness without being computationally burdensome. Furthermore, a weighting factor is assigned to each feature point, depending upon the class of triangular patch to which it belongs. The weighting factor assigned to a feature point selected from the i^{th} triangular patch is given by the following relationship.

$$W_{pi} = \begin{cases} W_g, & \text{for all } i \in _g \\ W_l, & \text{for all } i \in _l \end{cases}$$

where W_g is greater than W_l .
 (Emphasis added.)

Also, as noted in the specification on page 9, first paragraph:

The weighting factors are used in the Least Mean Square estimation of the global motion parameters in this particular embodiment, as described in more detail later, and there, the facial regions contributing more to the global motion have more weighting factors than the ones predominantly contributing to local motion; however, the invention is not restricted in scope to this embodiment. (Emphasis added.)

No where does Dachiku or the other references teach or suggest selecting a limited number of feature points from an image of the face where minimal or no local motion is observed to be video coded. The Examiner refers to Dachiku at column 9, lines 55-60 and column 11, lines 20-30 to support minimal or no local motion observed. In particular, column 9, lines 55-60 of Dachiku provides:

However, since differences are almost nil in the flat parts of a moving object in this method, the moving region is broken down into many isolated moving areas as illustrated in FIG. 5, with the result that there occurs the problem of an increased number of moving region.

Column 11, lines 20-30 provides:

As shown in FIG. 11, eight allowable directions of movement are numbered and initially a relevant number is transmitted and, thereafter, only the difference from the preceding direction is transmitted. Where a strictly exact contour information need not be transmitted, only the locations of representative points are transmitted and the intervals are interpolated using a curve such as a spline curve as shown in FIG. 12. When this technique is applied to motion pictures, only the amounts of offset of feature points are transmitted so that the data size can be further reduced.

In merging the still region, background compensation region and moving region, cut and paste method is visually unacceptable because the contour is accentuated. FIG. 13 is a one-dimensional representation of background and moving region signals.

No where does the above passage in Dachiku support selecting a limited number of feature points from an image of the face where minimal or no local motion is observed to be

video coded. In fact, Dachiku in the above passage and in the patent as a whole teaches away from this. Dachiku is directed to isolating moving areas, not isolating minimal or no location motion areas as in embodiments of the invention.

The Examiner also refers to FIGS. 5 and 12 of Dachiku. As noted, FIG. 5 is "a schematic diagram illustrating the extraction of a moving region by elimination of isolated points of interframe difference and regional consolidation." (Emphasis added.) Similarly, FIG. 12 is a diagrammatic representation of the selective transmission of representative points and interpolation between the points for construction of a contour or borderline for moving regions.

The present invention provides for global motion estimation which is novel in the sense that instead of considering all the feature points, only a subset of the feature points which contribute to the global motion are considered. In particular, embodiments of the present invention choose most of the feature points in the object that either do not undergo local motion at all or where minimal local motion is observed. Additionally, there is also no motivation to combine these references.

Claim Rejections – 35 USC S.103

The Examiner rejected claims 8-13 under 35 U.S.C. 102(b) as being anticipated by Dachiku in view of Kang and claims 15-18 and 19-20 as being unpatentable over Dachiku in view of Kang and further in view of Szeliski.

Applicant respectfully traverses the Examiner's rejection for the same reasons noted above. Additionally, there is also no motivation to combine these references.

CONCLUSION

In view of the foregoing, it is respectfully asserted that all of the claims pending in this patent application are in condition for allowance.


The required fee for a three month extension of time is enclosed. No additional fees are required for additional claims. Should it be determined that an additional fee is due under 37 CFR §§1.16 or 1.17, or any excess fee has been received, please charge that fee or credit the amount of overcharge to deposit account #02-2666.

If the Examiner has any questions, he is invited to contact the undersigned at (323) 654-8218. Reconsideration of this patent application and early allowance of all the claims is respectfully requested.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, Post Office Box 1450, Alexandria, Virginia 22313-1450 on March 7, 2005.


Margaux Rodriguez March 7, 2005